BENEFITS AND COSTS INVOLVED IN EASTERN ARCTIC RESUPPLY THROUGH CHURCHILL

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Introduction

For several years now the department has been receiving representations supporting the idea of making greater use of the Port of Churchill, Manitoba for resupply and other shipments destined for the Eastern Arctic - notably the Keewatin region of the Northwest Territories. The Hudson's Bay Route Association, the Government of Manitoba and, at one time, the Northwest Territories Government have all been major supporters of the idea. The survival and development of the Port of Churchill is a matter of great concern to western politicians, both federal and provincial, and was discussed at the "Churchill Arctic Corridor Conference", sponsored by the Great Plains Project held in Churchill from the 7th of May to the 10th of May, 1973. The future of Churchill also has taken on greater importance in view of the emphasis placed on the West as an area of concern in the January, 1973 Throne speech.

Currently, the federal and Manitoba governments are participating in a joint $10 million redevelopment project to renew and improve the townsite of Churchill, including demolition of substandard housing, the installation of water and sewer facilities, a sewage treatment plant, and construction of new housing units and recreational facilities. The project is scheduled for completion in 1975.

At present two other federal agencies are conducting studies on Churchill. The National Harbours Board has completed a series of detailed studies of the requirements for and feasibility of improving and renovating the harbour facilities.[1] A possible $5 to $20 million improvement program is envisaged, depending on the degree of improvements judged necessary and authorized.

The purpose of this study is to investigate the benefits and costs that could be involved in routing a greater proportion of Eastern Arctic (except Arctic Quebec) supply traffic through Churchill, rather than Montreal.

In order to carry out the study, the Eastern Arctic has been subdivided into areas based on the "Shipping Safety Control Zones" established under the Arctic Waters Pollution Prevention Regulations. These same areas are used in calling tenders for transportation services by the Ministry of Transport, and the settlements included in each are shown below.

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[1] They are awaiting approval by the Minister of Transport for release.

EASTERN ARCTIC AREAS

Foxe Basin area

Repulse Bay
Igloolik
Hall Beach

South Baffin area

Frobisher Bay
Pangnirtung

Baffin and Resolute area

Resolute Bay
Arctic Bay
Pond Inlet
Clyde River
Broughton Island

Hudson Bay & Hudson Strait

Eskimo Point
Whale Cove
Rankin Inlet
Chesterfield Inlet
Baker Lake
Coral Harbour
Cape Dorset
Lake Harbour
Port Burwell

High Arctic

Eureka
Grise Fiord

Each one of these areas must be considered individually when evaluating the possibility of supply through Churchill, or the costs and benefits of a supply operation through Churchill.

Foxe Basin - This area experiences among the worst ice conditions in the Arctic making the use of large ice-strengthened (Ice Class I) ships mandatory, in accordance with Arctic Pollution Prevention Regulations (with the possible exception of Repulse Bay). Any ships going into this area are obliged to pay high additional insurance premiums per voyage, and this accounts for much of the high cost of supplying these settlements. Since the expense of operating a large ice-strengthened ship out of Churchill for the small amount of cargo involved would be exorbitant, Igloolik and Hall Beach are omitted from further consideration. However, there is a possibility of getting to Repulse Bay with a smaller ship or barge because it is more sheltered, and so Repulse Bay is included among the settlements considered for supply through Churchill.

South Baffin)
Baffin and Resolute)
High Arctic)

With the possible exception of Frobisher Bay, it would not be practical to service settlements in these areas from Churchill. Ice Class 1 vessels could be brought into Churchill from Montreal or other southern ports to transport cargo to these areas from Churchill, but the cost would be enormous. The higher cost could be minimized if the vessel carried cargo from a southern port for discharge before calling at Churchill, but the Keewatin settlements would be reached too late in the season under that arrangement and there still would be a dollar penalty.

Hudson Bay and Hudson Strait

Most of these settlements are close to Churchill on the west coast of Hudson's Bay. Normally ice is not a major problem,

TABLE 1

TOTAL RESUPPLY TRAFFIC TO KEEWATIN SETTLEMENTS 1972

(Short tons)

Settlement	DRY CARGO[2]			BULK PETROLEUM[3]
	from Montreal	from Churchill	Total	from Churchill
Baker Lake	1,438	108	1,546	2,595
Belcher Islands	369	47	416	Shell[4]
Chesterfield Inlet	337	37	374	1,028
Coral Harbour	1,046	80	1,126	1,829
Eskimo Point	746	49	795	1,805
Rankin Inlet	1,056	122	1,178	2,537
Repulse Bay	363	415	778	588
Whale Cove	145	175	318	747
TOTALS[1]	5,500	1,031	6,531	11,131

Notes:

1) Totals may not reconcile with individual figures because of rounding.

2) Dry cargo totals include: Missions, Department of Indian Affairs and Northern Development, Energy, Mines and Resources, Department of National Defence, National Health and Welfare, Ministry of Transport, Northwest Territories Government, Northern Canada Power Commission, Co-Ops, Royal Canadian Mounted Police, Department of Public Works, commercial firms, private individuals and Hudson's Bay Company.

3) Bulk petroleum totals include all users (mainly Northern Canada Power Commission, Northwest Territories Government and Ministry of Transport).

4) Belcher Islands were supplied under the contract awarded to Shell for Arctic Quebec.

Sources:

i) Ministry of Transport Marine Services, Northern Resupply Statistics, 1972

ii) Hudson's Bay Company

iii) Ministry of Transport Marine Services, Financial Branch.

TABLE 2

DRY CARGO SHIPMENTS TO KEEWATIN SETTLEMENTS 1972

(SHORT TONS)

	FROM MONTREAL					FROM CHURCHILL					
Settlement	N.W.T. Gov't.	Other[1] Gov't.	Hudson's Bay Company	Other[2]	TOTAL	N.W.T. Gov't.	Other[1] Gov't.	Hudson's Bay Co.	Other[2]	TOTAL	GRAND TOTAL
Baker Lake	581.096	377.512	441.140	37.860	1,437.608	15.995	33.065	3.393	55.241	107.694	1,545.302
Belcher Islands	203.401	2.181	131.5[3]	31.914	368.996	40.007	-	-	7.177	47.184	416.180
Chesterfield Inlet	135.555	51.232	150.	.550	337.337	18.603	1.827	-	16.955	37.385	324.722
Coral Harbour	246.652	388.141	393.	18.356	1,046.149	4.818	34.852	-	40.169	79.839	1,125.988
Eskimo Point	129.565	148.061	463.	5.397	746.023	6.796	11.994	-	29.759	48.549	794.572
Rankin Inlet	482.475	110.354	453.	10.150	1,055.979	40.411	18.043	.315	62.731	121.500	1,177.479
Repulse Bay	189.571	82.296	79.	12.185	363.052	144.184	-	-	270.578	414.762	777.814
Whale Cove	64.494	80.169	-	.144	144.807	5.483	-	-	167.833	173.316	318.123
TOTALS	2,032.809	1,239.946	2,110.640	116.556	5,499.951	276.297	99.781	3.708	650.443	1,030.229	6,530.180

Notes:

[1] Other Gov't. includes: Department of Indian Affairs and Northern Development; Department of Energy, Mines and Resources; Department of National Defence; Department of National Health and Welfare; Ministry of Transport; Department of Public Works; Northern Canada Power Commission; Royal Canadian Mounted Police.

[2] Other includes: Missions; Co-operatives; commercial interests; private individuals.

[3] via Moosonee

Sources:

i) Ministry of Transport Marine Services, Northern Resupply Statistics, 1972.

ii) Hudson's Bay Company

and the bay itself is usually navigable about one month before the strait.

It is felt that these settlements (with the exception of Cape Dorset, Lake Harbour and Port Burwell) could reasonably be supplied from Churchill using small 500-600 DWT ships or barges making several trips back and forth. It may also be feasible to winter a small ship, ships,or barges and tugs in Churchill in order to take advantage of the extra month of navigation. For this reason the analysis in this study will be restricted to these settlements, plus Repulse Bay and Belcher Islands for possible supply from Churchill. Cost comparisons will be based initially on rate per ton charged by coastal freighters similar to those in use out of Montreal.

It is hoped that the analysis presented here will provide sufficient background information to develop a clear understanding of the basic constraints involved in rerouting supply operations through Churchill.

Keewatin Region Supply Traffic 1972

Quantity of Dry Cargo and Bulk Petroleum Products

Table 1 shows the total amount of dry freight and bulk petroleum products landed at each of the settlements in 1972. A more detailed breakdown of dry freight by customer grouping is given in Table 2. It can be seen that only 1,030 tons[1]

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[1] Short tons (2,000 pounds) are used throughout this study.

(15.8 per cent) of the total 6,530 tons of dry cargo shipped to these eight settlements was routed through Churchill in 1972. In addition to the dry cargo there were some 11,131 short tons of bulk petroleum products shipped through Churchill to the above settlements for the Government of the Northwest Territories, Northern Canada Power Commission, (NCPC) and Ministry of Transport (MOT). All of this bulk fuel originated in Churchill, as it was shipped direct from the Venezuelan Aruba refinery by large tanker to Churchill. It was then redistributed from the tank farm in Churchill to the settlements using a smaller chartered tanker and lightering vessels owned and operated by M.O.T. No charge was made to the customer for lightering in 1972; however, starting in 1974 users will have to pay for this service if MOT receives its requested ma

It should be noted here that the composition of the dry freight will be considerably different in 1973 because gasoline in drums, which formed a large proportion in previous years, will not be included. Beginning this year, gasoline will also be shipped in by tanker and stored in the new bulk storage tanks erected last summer at the settlements. It is thus possible that the total amount of dry cargo will be less this year because of this change in gasoline supply methods, and the bulk petroleum products quantities will increase markedly.

Total Landed Costs - Dry Cargo

The total cost of transporting the dry cargo from Montreal, as a supply point, to destination is composed of two main components. First is the marshalling, warehousing, packing and crating in Montreal, which is most efficiently accomplished by entering into a contract with a warehousing firm. A representative idea of the cost of this portion of the transportation operation can be obtained from the charges under the contract in effect in 1972 between this department and Seaway Storage Inc., - which averaged to $40 a ton.

Second is the cost of ship transportation to the destination, including unloading and delivery to above high water mark. This used to be arranged on a time charter basis which proved most unsatisfactory and expensive, because the total cost was not known until the ships completed their missions and returned to Montreal. The most practical arrangement is to ship material on a rate per ton basis, so that total cost is known beforehand: this is the method now being used. Tenders are called each year from commercial ship operators and the rates quoted vary according to the specific conditions at each settlement, such as: the ice conditions to be expected, the distance offshore the ship must stay because of shallow water and the relative difficulty and time lost in landing cargo. The rates applicable to the 1972 Sealift were $126 a ton to the Keewatin settlements with the exception of

Repulse Bay ($185 a ton) and Belcher Islands ($140 a ton). Thus the total landed cost for dry cargo originating in Montreal in 1972 to each of the settlements was:

Baker Lake	$166 a ton
Belcher Islands	$180 a ton
Chesterfield Inlet	$166 a ton
Coral Harbour	$166 a ton
Eskimo Point	$166 a ton
Rankin Inlet	$166 a ton
Repulse Bay	$225 a ton
Whale Cove	$166 a ton

Because of the lack of certain information it is not possible to state accurately what cost differential there might be between the cost of purchasing material f.o.b. Churchill and f.o.b. Montreal. The nearest supply point to Churchill is Winnipeg and for calculation purposes the following components would have to be examined to arrive at a total landed price at the settlements:

f.o.b. Churchill	f.o.b. Montreal
- Price of goods at Winnipeg[1]	- Price of goods at Montreal
- Cost for marshalling, crating, packaging at Winnipeg	- Cost for marshalling, cratin packaging at Montreal
- Rail cost transportation Winnipeg to Churchill	-
- Handling cost at Churchill	-
- Transportation charges Churchill to destination	- Transportation charges Montr to destination

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[1] The variety and range of commodities available from suppliers in Montreal may not be available in Winnipeg, or may cost significantly more there. This subject is considered later in this study.

In 1972 a limited amount of cargo, consisting of many different commodities, was shipped through the port of Churchill. Most of this cargo was shipped in less-than-carload lots from Winnipeg at a cost of about $80 a ton. The packaging cost was included in the purchase price of the goods, but a breakdown showing the cost of packaging as part of the total purchase price is not available.

Handling and warehousing (unloading rail cars, palletizing if necessary, movement to ship's side and stowing in ship's hold) cost $25 a ton at Churchill under a one year contract awarded by M.O.T. to Wolfe Stevedores (1968) Ltd. Some idea of the cost of ship transportation from Churchill may be gained from the specific rates quoted by Agence Maritime (M.V. Inland) of $149 a ton for 415 tons to Repulse Bay, and on the M.V. Fort Lennox of $140 a ton[1] for 173 tons to Whale Cove. It must be emphasized here that these rates are so low only because the company already had the vessels in Hudson Bay on supply missions, and it was thus a simple and inexpensive matter to divert them to Churchill to pick up these shipments. At present, this is the only way ships would be available at Churchill since there are none based at the port of Churchill now. Based on the above costs, it can be seen that the total landed costs via Churchill (from supply point to Repulse Bay) amounted to $254 a ton ($80 + $25 +$149). This figure excludes packaging costs which are not known but were included in the purchase price. The comparative total cost through Montreal including packaging costs was $225 a ton in 1972. Similarly, total landed costs to Whale Cove via Churchill amounted to $245 a ton ($80 + $25 + $140 , excluding packaging), as opposed to $166 a ton from Montreal (including packaging). While these figures may not be representative, they indicate a substantial direct cost penalty by using the port of Churchill in 1972, (at least $29 a ton to Repulse Bay or at least $79 a ton to Whale Cove).

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[1] Information quoted here obtained from H.R. Budden (MOT Cargo Superintendent) by telephone 5/4/73. In addition, several trips were made from Churchill to many of the Keewatin settlements by the small M.O.T. Northern Supply Vessels MV Eider and Puffin. A rate of $100 a ton was charged except for extremely bulky or high volume-to-weight commodities (trailers, prefabricated houses, etc.) for which a rate of $250 a ton was charged to compensate for the loss of space. These rates, however, are not indicative of the true costs, and are thus not used in the analysis.

Total Landed Cost - Bulk Petroleum Products

All bulk heating and diesel fuel products for the Keewatin settlements originated in Churchill in 1972 and the 11,131 tons[1] were transported by the tanker Maplebranch and landed by the M.V. Eider and Puffin. The Maplebranch was chartered at $3,300 a day plus bunkerage, plus insurance to supply ten points: the Keewatin settlements (excluding Belcher Islands) plus Pangnirtung, Hall Beach and Igloolik. As a result, it is impossible to calculate the cost applicable to supplying only the Keewatin, since the additional insurance and other costs entailed in going to the Foxe Basin settlements are included. However, the average cost for supplying the ten sites with a total of 17,425 tons of bulk fuel products was $23.84 a ton,[1] including the cost of ballasting the ship from Montreal to Churchill and returning at the completion of the charter.

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[1] M.O.T. Marine Services - Finance Branch

The cost of landing the fuel from the M.V. Maplebranch, however, is not included in the above. In 1972, M.O.T. insisted on the use of sea hoses wherever possible (mainly Arctic Quebec) in order to reduce the requirements for lightering by the M.V. Eider and M.V. Puffin. The resulting decrease in the total tonnage of bulk fuel lightered, combined with the fixed cost of operating and maintaining the two vessels in the North dramatically increased the cost per ton over 1971 costs ($14.52 per ton) of fuel lightered in the Keewatin. The 1972 cost for lightering, considering the total amount handled (it is not possible to extract the Keewatin costs), amounted to $32.88[2] a ton.

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[1] M.O.T. Marine Services - Finance Branch.

[2] M.O.T. Marine Services - Finance Branch.

It is felt by M.O.T. that this cost could be reduced by one half by maintaining only one of the two small vessels in the North, and it is their goal to reduce the requirements for lightering to a level that will require only one vessel. Because of this, M.O.T. feels that the 1972 cost figures are not typical and may be reduced significantly in the near future. However, it is the opinion of the Materiel Management Division of Technical Services Branch that two lightering vessels will be required for both dry cargo and bulk fuel for the next several years at least.

Thus, the total landed cost for transportation of heating and diesel fuel in the Keewatin area in 1972 was $23.84 a ton, plus $32.88 a ton (for lightering) or $56.72 a ton.

Benefits from Keewatin Resupply through Churchill

Actual Benefits - 1972

Information supplied by Wolfe Stevedores (1968) Ltd. indicates that each ton of dry cargo handled by them in Churchill requires an average of 2 man-hours of direct longshore labour plus a further 2 man-hours if unloading of railway cars is required. If one assumes an overall average of 3 man-hours per ton, this implies a requirement for 3,090 man-hours of labour to handle the 1972 Keewatin dry cargo traffic through Churchill, (3 x 1,030 tons).

Supervision for this number of man-hours, assuming an average stevedore gang of 18 men, would require one foreman-hour for every 18 man-hours. This would mean approximately 172 foreman hours ($\frac{3,090}{18}$).

The longshore labour requirements in Churchill are met from a pool organized and maintained during the 12 week season by the National Harbours Board. Assuming a 40 hour week with no overtime, the 3,090 man-hours attributable to resupply traffic could be equivalent to the employment of 7 men[1] during the 12 week season. In fact, this figure probably overstates the actual number because many of the seasonal staff work as much overtime as possible in order to earn more money. Thus, fewer men could provide the required total man-hours of work.

Even if one regards this as the creation of seven seasonal jobs, it may have no effect on the local labour force. Present indications are that the Churchill community has conditions of almost full employment, especially in the summer and fall months. According to the local Manpower officer, available personnel are all working and casual labourers can be found only with great difficulty.[2]

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[1] Men equivalent $= \frac{\text{3,090 man-hours}}{\text{(40 hours} \times \text{12 weeks)}} = 6.44$ men or 7 men.

[2] Impex (Trade Journal of Port of Churchill Commission) 1972.

This indicates that all those who wish to work are working - and those who are not working are doing so by choice - not for lack of jobs. Thus it appears likely there would be better interest in filling jobs created by the resupply traffic. It appears that this close to full employment situation will continue at least until the current reconstruction of the Churchill townsite is completed in 1975. Thus seasonal jobs created by the operations at the port would attract workers from outside the Churchill area, and it is likely that any jobs resulting from the resupply traffic would also be filled by men from outside Churchill.

At present, experienced foremen to supervise the stevedoring gangs are brought into Churchill for the season from other ports where Wolfe Stevedores operates, thus offering no opportunity for local employment at this time. In any case, the requirements for 172 man-hours of supervision would not even fully employ one foreman for the 12 weeks.

The rates paid by Wolfe Stevedores to the National Harbours Board for labour in the latter part of the 1972 season were composed of several components as shown below ($ per hour):

	Men	Foremen
National Harbours Board Wages	$3.30	$4.15
Isolation Pay	.38[1]	.38

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[1] Varies with marital status and type of accommodation in Churchill.

	Men	Foremen
60% Surcharge payable to NHB	2.10[1]	2.718
Bonus for completing the season	.20	.20
2% P.L. and P.D. (on Wages and Isolation pay)	.0736	.0906
	$6.1536	$7.5386
Rate per hour	$6.16	$7.54

Only a portion of this rate is actually received by the stevedores, ($3.88 an hour for men and $4.73 an hour for foremen): only that portion has any chance of influencing the Churchill economy. On this basis, an approximation of the total wages paid in respect to the handling of resupply traffic in 1972 would be $12,803, developed as follows:

Stevedores wages:	$3.88 per hour x 3090 hours =	$11,989
Foreman's wages :	$4.73 per hour x 172 hours =	814
		12,803

This amount does not include wages paid for the clerical work involved in preparing the documentation for the cargo, nor does it include any portion of the managerial, supervisory or overhead costs of the stevedoring operations in the port. This would be most difficult to calculate and since the resupply traffic to the Keewatin was such a small proportion of the total tonnage handled through the Port of Churchill (1030 of 771,603 tons or 0.13 per cent), the proportion of the above costs assignable to this traffic would be insignificant.

It is difficult to assess what proportion of these wages that remain within or contribute to the Churchill economy, as the spending patterns of the men involved are not known. The situation is further complicated by the fact that only some 60 per cent of the seasonal staff reside locally and the remaining 40 per cent are non-residents. These people typically come to Churchill during the shipping season from other parts of northern Manitoba or Saskatchewan, and then return home afterwards. In addition, consideration of any income multiplier effects within the Churchill economy is precluded by the short time available to complete this study, and the lack of a precise estimate of the multiplier applicable.

Since a detailed analysis of the spending patterns of the seasonal staff in Churchill is unavailable, some idea of the impact on the local economy of these jobs may be developed by arbitrarly assuming that a certain proportion of the wages remain in the economy. The portion that will have an impact on the economy will be mainly that part spent on lodging, food and beverages in Churchill. If one assumes that these items would account for 60 per cent of disposable income, one could say that the initial monitary input to the Churchill economy originating with the Keewatin resupply traffic handled in 1972 would be $7,688. If one assumes 40 per cent or 80 per cent instead of 60 per cent the input would be $5,126, or $10,252 respectively.

In summary, one could say that the 1972 Keewatin resupply traffic via Churchill was responsible for the creation of seven seasonal jobs and an input to the Churchill economy of some $7,688. Viewed in perspective of the up to 130 seasonal jobs created by the entire port operations (28 of these as unskilled labour) and the total of the operating, maintenance, administrative expenses of the port, plus the grants in lieu of taxes paid by the NHB to Churchill of over $2,000,000 in 1972, the impact due to resupply operations is minimal.

Possible Future Benefits

If one assumes that the 3 man-hours per ton of dry cargo will remain valid, it is possible to develop a rough estimate of the number of jobs and other benefits created by routing resupply traffic through Churchill. However, if a shift from Montreal is considered, it must be remembered that job creation in Churchill would actually be a transfer of jobs from Montreal and not new jobs, therefore there is no net benefit to the Canadian economy as a whole. However, if one regards benefits from a regional point of view, that is, benefits to Churchill or the western economy, one can speak of net benefits to the western economy.

The following table summarizes possible employment, wage payments, and the proportion of wages one might say remains within the Churchill economy, for different volumes of dry cargo handled through Churchill. These calculations are based on the same assumptions as in the previous section.

Table 3

POSSIBLE JOB CREATION AND WAGE PAYMENTS DUE TO KEEWATIN RESUPPLY THROUGH CHURCHILL

	Seasonal Jobs Created					Proportion of Wages Remaining in Churchill		
Volume (tons)	Stevedores Man Hours	Stevedores Men	Foremen Man Hours	Foremen Men	Wages Paid (Total) ($)	40% ($)	60% ($)	80% ($)
1030	3090	7	172	1	12,803	5,126	7,688	10,252
2000	6000	13	333	1	24,855	9,942	14,913	19,884
3000	9000	19	500	2	37,285	14,914	22,371	29,828
4000	12000	25	667	2	49,715	19,886	29,829	39,772
5000	15000	31	833	2	62,140	24,856	37,284	48,712
6000	18000	38	1000	3	74,570	29,828	44,742	59,656

One can see from the above table that the 1972 labour pool of 28 stevedores could have handled approximately 4,500 tons of resupply traffic, if there was no import or export general cargo to handle. Even with a normal amount of import general cargo (3,000 tons) and export cargo (4,000-6,000 tons of nickel) there is still sufficient excess manpower available to handle a significant increase in resupply traffic in excess of the 1030 tons in 1972. If resupply traffic was to increase to 5,000 tons and adequate shed and dock facilities existed, it is possible that 12 extra men might be hired for one month of the season if, for instance, import shipments from the British Isles and the resupply traffic had to be handled at the same time.

The major implication here is that since a number of men are already employed by the National Harbours Board, and kept on call during the shipping season at Churchill, and are at present underutilized - there would really be few, if any, manpower requirements created by an increase in resupply traffic through Churchill.

Other Benefits

Two other benefits, both of which would be very difficult to quantify, would also accrue to Manitoba from a Keewatin resupply out of Churchill;

(i) Some purchasing for the Keewatin would be diverted from Eastern to Western Canada,

(ii) It would assist in changing the image of Churchill from that of a grain shipping terminus.

If Churchill, rather than Montreal, was the port for the Keewatin resupply, western Canadian manufacturers would gain an advantage through savings in transportation costs to the shipping port. In addition, shippers would have a tendency to look more to Manitoba and western Canada as supply sources for commodities not acquired by tender.

The amount of material being supplied to the Keewatin is not large but it might be significant as part of an overall strategy to improve manufacturing in western Canada.

The port of Churchill is currently thought of as a rather minor grain shipping terminus. The Manitoba government, however, is seeking to increase the importance of the port by enlarging and diversifying its role. Shifting of the Keewatin resupply to Churchill would be part of this plan.

Costs of Keewatin Resupply through Churchill

Harbour Improvements

In order to adequately handle an increased volume of resupply cargo, expanded shed facilities and improved security in the port area would be required. More enclosed storage space is needed for cargo that cannot be stored outside, and an adequately fenced yard is needed to protect goods stored outside from pilferage and damage. Discussion with Technical Services Branch indicates that improvements of this type could entail capital investments of some $400,000.

Transportation Cost Difference

Until 1972 the rates quoted for shipment of dry cargo via Montreal to the Keewatin settlements meant that a substantial cost penalty would have been incurred if resupply traffic had been routed through Churchill. (For example, there would have been a penalty of $29 a ton to Repulse Bay or at least $79 a ton to Whale Cove in 1972, using coastal vessels from Montreal that were already in Hudson's Bay on resupply missions). However, 1972 was one of the worst years on record for navigation in the Arctic and delays due to weather, ice conditions, and damage to the ships, placed many ship owners in financial difficulties. Increases in marine insurance rates and stevedoring costs in Montreal have also increased the cost of handling cargo. Consequently, the rates quoted from Montreal for 1973 are substantially higher than previous years. In addition, removal of the gasoline in drums from the dry cargo mix contributes significantly to the increase in rates in two ways. Firstly, because the remaining cargo has a high volume-to-weight ratio, there will be less efficient utilization of the cubic capacity of the ships, and the ship owners have to charge for this loss of space. Secondly, the total tonnage will be much lower.

For example, the lowest tender for transportation of dry cargo to the Keewatin Area from Montreal averaged $211 a ton for 1973, as opposed to $126 in 1972. To these amounts must be added the average costs for the Montreal marshalling, packing, handling contract of approximately $40 a ton. Thus total landed costs via Montreal for 1973 are likely to be around $251 a ton as opposed to $166 in 1972.

The foregoing indicates a problem in selecting a base year for a Churchill-Montreal comparison. Clearly the recent changes in the cargo mix out of Montreal would have to be taken into account. However, the very large increase in rates in 1973 may result in fewer rate increases in future years out of Montreal than out of Churchill and the difference in shipping costs could revert to 1972 levels.

In order to arrive at a comparative dry cargo cost via Churchill, there are three possible marine alternatives. Added to these must be the cost of rail transportation from a supply centre (Winnipeg possibly) and handling in Churchill.

i) Coastal vessel from Montreal - this alternative seems most unlikely because the cost of bringing the vessel (or vessels) from Montreal to Churchill in ballast would be prohibitive, and if they were loaded with resupply traffic in Montreal that would leave less, or possibly almost none, to be shipped through Churchill.

ii) Tug and barge from Churchill - Northern Transportation Company Limited have proposed wintering several tugs and a number of barges in Churchill to resupply the Keewatin area with both bulk petroleum and dry cargo. A capital investment of $4,000,000 was anticipated (November 1971 proposal) and approximate rates quoted for a combined dry cargo/bulk petroleum operation from Churchill to the settlements ranged to $117.32 a ton, for dry cargo (assuming 6,000 tons and including handling and loading) and up to $33.00 a ton, for bulk petroleum products (based on 12,000 tons), for both 1972 and 1973. Adding the rail charge from Winnipeg of $40 a ton for carload lots, and $40 a ton for marshalling and packaging in Winnipeg to the dry cargo rate,[1] one arrives at a landed cost of $197.32 a ton. This of course assumes 6,000 tons of dry cargo materialize and there is no increase in NTCL capital and operating costs; both prospects are unlikely. Capital and operating costs have increased markedly since the 1971 NTCL proposal, and it is unlikely that the amount of dry cargo destined for the Keewatin settlements will exceed 4,000 tons this year, if it attains that level.

It is thus felt that the actual rates charged by NTCL would be considerably in excess of those above. In addition, the NTCL proposal is based on a combined dry/bulk petroleum operation - and that proposal would not be feasible if, for instance, bulk diesel and gasoline continued to be transported, as in 1972, from Churchill to the settlements by chartered tanker.

iii) Coastal vessel from Churchill - another possibility would be to base a small coastal ship (500-600 DWT) in Churchill for use during the four month navigation season. This has not been done before because there was no demand for such a ship, and it was assumed that the fixed costs of having the ship idle for eight months of the year, and the costs of wintering it there, would not be economically feasible for a self-sustaining commercial operation. Inquiries were made with a shipping firm experienced in northern operations.

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[1] If NTCL were to begin operations of its normal type of marshalling service at Churchill well before the shipping season, it is possible that this $40 could be eliminated and about 80 per cent of the cargo could be shipped in carload lots by the suppliers. The balance of cargo at LCL rates would add about $20 a ton.

In an attempt to arrive at some estimate of what a per ton rate would be under these circumstances, preliminary figures supplied indicate that dry cargo could be carried from Churchill to the settlements for about $190 a ton, (excluding loading at Churchill) and assuming a minimum three year contract. Bulk petroleum products could be delivered for 16 cents a gallon or approximately $38.40 a ton. The vessels involved (two for 4,500 tons of dry cargo) would carry both dry cargo and bulk fuel so this would also have to be a combined dry cargo/bulk petroleum operation. Adding the rail charge from Winnipeg of $40 a ton for carload lots and $40 a ton for marshalling and packaging, and the 1973 estimated handling charges in Churchill ($32 a ton) to the dry cargo rate, one arrives at a landed cost of $302 a ton.

Product Cost and Purchasing Flexibility

There are also likely to be diseconomies involved in using Winnipeg rather than Montreal as a supply centre. There is likely to be a more restricted range of commodities available, and those not available in the Winnipeg area may have to be brought in from other western provinces, Ontario or even Montreal, thus increasing the purchase prices of those commodities. It is also probable that product prices may be generally higher in Winnipeg than Montreal. Although it is difficult to specify the exact increase, an additional 5 per cent of the Montreal price has been suggested.[1]

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[1] Technical Services Branch, Materiel Management Division.

Effect on Marshalling Contract in Montreal

The withdrawal of the resupply traffic for the Keewatin area from the centralized marshalling and packaging arrangements with a warehousing firm in Montreal is likely to increase marshalling costs for the remaining shipments through Montreal. There are significant economies of scale possible with the over 10,000 tons of dry cargo usually handled under the contracts with the warehousing firm; however, a portion of these economies of scale would be lost if a large proportion of this total were to be routed via Churchill.

Damage and Pilferage

Because of the rail haul between Winnipeg and Churchill, all cargo being shipped via Churchill would have to be handled twice again more than cargo shipped via Montreal. It is well known that handling costs form a disproportionately large part of transportation costs, and extra handling increases the possibility of damage to the goods. The possibility of greater damage is a matter for serious consideration, as much effort has been expended over the past several years to decrease pilferage and damage to cargo.

Conclusions

This study was originally intended to consider the benefits and costs involved in the resupply of the Eastern Arctic, (Keewatin, Foxe Basin, Baffin regions excluding Arctic Quebec) through Churchill. Initial analysis quickly showed, however, that it is most unlikely that resupply of the Foxe Basin or Baffin areas could be carried out from Churchill at the present time and thus the analysis was concentrated on Keewatin resupply.

There do not appear to be many tangible benefits to Manitoba that could be associated with a Keewatin resupply operation through Churchill. Given that even at best,this operation would be only operating three to four months of the year, any jobs created would be only seasonal ones and the number would depend mainly on the total tonnage of dry cargo involved. Shipment of bulk petroleum products is already carried out through Churchill, and requires only a minimum of labour. Thus even with expanded shipments this year (including bulk gasoline for the first time),there are virtually no jobs created by the handling of bulk petroleum products.

Jobs attributable to a resupply operation through Churchill would be mainly of two types: unskilled stevedores and qualified ship crew members. The ships crews are unlikely to originate locally and are most likely to originate in Montreal or other southern Canadian ports, so there will be no change in the local or regional (Northern Manitoba and Saskatchewan) employment situation or unemployment insurance and social assistance payments. With regard to stevedores, the available seasonal manpower in the Port of Churchill is presently underutilized, and could easily handle a significant increase in resupply dry cargo traffic.

If one calculates the wages paid in respect to handling the resupply cargo in Churchill in 1972, and assumes that 60 per cent of gross wages are injected into the Churchill economy (mainly for food, lodging, entertainment) , the total input to the economy amounted to some $7,688 in 1972. If resupply traffic were to increase to 4,000 tons, a possible injection (assuming current wage rates), could be $29,829. However, in view of the operating budget for the Port of Churchill which is in excess of $2,000,000,these amounts are not significant.

There would be two benefits to Manitoba from a Keewatin resupply out of Churchill; both are difficult to quantify:

(a) It would likely divert some purchasing for the Keewatin from Eastern to Western Canada,

(b) It would increase the stature of Churchill as a port by changing its role from that of being solely a grain shipping terminus.

It is not possible at the present time to arrive at any definite conclusions about the relative merits to the Keewatin (or the Government of the Northwest Territories) of routing via Churchill vis a vis Montreal for Keewatin resupply. The primary reason is that there is no ship based in Churchill to transport the goods to the settlements, thus one would have to come from Montreal. The economics of this type of movement (in ballast or with cargo) in order to deliver further cargo from Churchill, are questionable, although if the per ton rates through Montreal continue to rise, it may become feasible.

The other possibilities for providing ship transport from Churchill (tug and barges or small coastal freighters wintered there), would seem to require more intensive study now to establish the economic aspects of each type of operation. The Ministry of Transport (through the Policy Adviser, Northern Transportation) is currently examining in detail the feasibility of wintering vessels in Churchill, and so there is no need to duplicate their work here. Preliminary figures from a commercial ship operator experienced in northern operations indicate that dry cargo could be landed at the Keewatin settlements for $302 a ton, using small coastal ships similar to the Ministry of Transport NSV's which are capable of carrying both bulk petroleum and dry cargo. This total landed cost (including rail charges from Winnipeg, marshalling and packaging in Winnipeg and handling in Churchill) is still in excess of the lowest 1973 rate via Montreal of $251 a ton (including marshalling, handling and so on in Montreal).

The rates quoted in the 1971 NTCL tug and barge proposal would result in a total landed cost of some $197.32 a ton in 1973; however, it is unlikely that this rate would still apply this year because of the increases in capital and operating costs generally since 1971.

The large increase this year in per ton rates via Montreal seems to have placed Churchill in a more favourable position as a re-supply port. If an increasing cost trend continues, it is possible that a resupply operation through Churchill could become an economical proposition in the near future, notwithstanding the minimal benefits to Churchill itself or northern Manitoba or Saskatchewan.

It must be remembered, however, that previous to 1973 the landed costs through Montreal were much lower than the estimated costs through Churchill, and that a substantial cost penalty would have been incurred by shipping through Churchill. If, as a result of the very large increase in rates in 1973, costs escalate at a slower rate via Montreal than via Churchill for the next few years, the cost difference could return to former levels. Nevertheless, even if shipping costs are comparable, because of: higher purchase prices in Winnipeg, loss of economies of scale in the Montreal marshalling operations, loss of purchasing flexibility, possible increased damage, the additional charges for the rail haul to Churchill, or any combination of these or other costs the only way to encourage the use of Churchill as a resupply port would be for the Government to subsidize the extra costs incurred.

In summary, the economic feasibility of a Keewatin resupply operation through Churchill is dependent on the landed costs quoted through Montreal. The additional cost components that must be considered with respect to a routing through Churchill are known, as is an estimate of the actual costs involved. However, only a comparison with the total costs quoted through Montreal in any given year will indicate which route is the most advantageous.

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